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APR 14 2015

DIV. OF OIL, GAS & MINING

## Application for Mineral Mine Plan Revision or Amendment

Operator: <u>U.S. Oil Sands</u>			
Mine Name: <u>PR Spring Mine</u>		File Number: M/ <u>047/0090</u>	
Provide a detailed listing of all changes to the mining and reclamation plan that will be required as a result of this change. Individually list all maps and drawings that are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise or amend the existing Mining and Reclamation Plan. <b>Include page, section and drawing numbers as part of the description.</b>			
<b>DETAILED SCHEDULE OF CHANGES TO THE MINING AND RECLAMATION PLAN</b>			
			<b>DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED</b>
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<u>Total (316 acre) bond calculation worksheets</u>
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I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments and obligations, herein.

Doug Thornton  
Print Name

[Signature] HSE & Regulatory Mgr.  
Sign Name, Position

Apr. 13, 2015  
Date

**Return to:**

State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
Box 145801  
Salt Lake City, Utah 84114-5801  
Phone: (801) 538-5291 Fax: (801) 359-3940

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<b>FOR DOGM USE ONLY:</b>
File #: M/ _____ / _____
Approved: _____
Bond Adjustment: from (\$) _____
to \$ _____

**Bonding Calculations**

**Direct Costs**

Subtotal Demolition and Removal	\$355,658.35
Subtotal Backfilling and Grading	\$1,220,471.45
Subtotal Revegetation	<u>\$239,592.30</u>
<b>Subtotal Direct Costs</b>	<b>\$1,815,722.09</b>

**Indirect Costs**

Mob/Demob	\$181,572.00	10.0%
Contingency	\$90,786.00	5.0%
Engineering Redesign	\$45,393.00	2.5%
Main Office Expense	\$123,469.00	6.8%
Project Management Fee	<u>\$45,393.00</u>	2.5%
<b>Subtotal Indirect Costs</b>	<b>\$486,613.00</b>	26.8%

**Total Cost 2015** **\$2,302,335.09**

Number of Years	5
Escalation Factor	0.019
Escalation	<b>\$227,193</b>

Reclamation Cost Escalated	\$2,529,528
Average Cost per Acre Disturbed	\$8,005

**Bond Amount (Rounded to nearest \$1,000)**  
**2020 Dollars**

**\$2,530,000**

Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight (tons)	Density	Time (hours)	Number	Unit	Swell Factor	Quantity	Unit	Cost
<b>DEMOLITION</b>																				
<b>Demolition of structures with cutting/loading by 4 laborers (cost of laborers based on weekly rate divided by 40 hours for standard work week)</b>																				
1	22 Tanks	Dismantle and load 22 tanks	013113200160	\$58.13	\$/hr									12				4		\$2,790.00
2	Maint. Shop & Warehouse	Dismantle and load 2 structures	013113200160	\$58.13	\$/hr									60				4		\$13,950.00
3	Power Plant	Dismantle and load power plant	013113200160	\$58.13	\$/hr									3				4		\$697.50
4	Process Train	Dismantle process train	013113200160	\$58.13	\$/hr									228				4		\$53,010.00
5	Solvent Recovery Unit	Dismantle unit	013113200160	\$58.13	\$/hr									4				4		\$930.00
6	Sand Dewater Unit	Dismantle sand dewater	013113200160	\$58.13	\$/hr									8				4		\$1,860.00
7	Secondary Containment Liners	Rip up liners	013113200160	\$58.13	\$/hr									40				4		\$9,300.00
8	Supply Well	Disconnect supply well piping and cap off the well by excavation	312216130110	\$1,369.20	\$/day									1				1		\$1,369.20
<b>Demolition and burial of materials, concrete pads, footings, and foundations onsite</b>																				
9	Sprung Structure Floor	Building Demolition Concrete to 6" thick	024113175200	\$ 15.75	\$/S Y					2222								1		\$34,996.50
10	One Conditioning and Handling	Building Demolition Concrete floor, footings and foundation 7"-24" thick	024113175400	\$ 122.00	\$/C Y							385								\$46,970.00
<b>REMOVAL</b>																				
<b>Removal of structures by loading dismantled pieces onto trucks with one 55-ton crane (cost of crane based on daily rate divided by 16 labor hours)</b>																				
1	22 Tanks	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									12				1		\$2,231.25
2	Maint. Shop & Warehouse	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									16				1		\$2,975.00
3	Power Plant	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									3				1		\$557.81
4	Process Train	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									228				1		\$42,393.75
5	Solvent Recovery Unit	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									4				1		\$743.75
6	Sand Dewater Unit	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									4				1		\$743.75
7	Secondary Containment Liners	Load dismantled pieces onto truck with crane	015419500400	\$185.94	\$/hr									60				1		\$11,156.25
11	Perimeter Fence	Removal of approximately 4,000 feet of fence	024113601775	\$2.14	\$/L F	4000												1		\$8,560.00
12	General Site Cleanup	Trash removal from entire permit area (316.2 acres) by 3 laborers with average pickup of 1.6 ac/hr		\$58.13	\$/hr					316.2				197.625				3		\$34,460.86
<b>TRANSPORT AND DISPOSAL</b>																				
<b>Transportation and disposal with 35-ton trucks at the Utah County Landfill located 88 miles from the mine site (\$15/ton disposal fee according to conversation on April 15, 2014)</b>																				
1	22 Tanks	Haul and disposal cost to Utah County Landfill	028120101260	\$4.45	\$/mile	176	miles					107				3	truckloads			\$3,999.35
2	Maint. shop & Warehouse	Haul and disposal cost to Utah County Landfill	028120101260	\$4.45	\$/mile	176	miles					35				4	truckloads			\$3,657.80
3	Power Plant	Haul and disposal cost to Utah County Landfill	028120101260	\$4.45	\$/mile	176	miles					20				1	truckloads			\$747.54
4	Process Train	Haul and disposal cost to Utah County Landfill	028120101260	\$4.45	\$/mile	176	miles					1995				57	truckloads			\$74,567.40
5	Solvent Recovery Unit	Haul and disposal cost to Utah County Landfill	028120101260	\$4.45	\$/mile	176	miles					30				1	truckloads			\$1,121.31
6	Sand Dewater Unit	Haul and disposal cost to Utah County Landfill	028120101260	\$4.45	\$/mile	176	miles					30				1	truckloads			\$1,121.31
13	Hydrocarbons	Removal of hydrocarbons from site to Tr-State Recycling, UT	28120101220	\$4.25	\$/mile	176												1		\$748.00

## NOTES:

- Up to an assumed 22 tanks with an assumed total weight 107 tons will be cut into pieces, lifted onto a trailer, and hauled to the Utah County Landfill. This includes all tanks shown on Figures 3 and 3A including the process sump tank and its pipeline.
- These structures will be dismantled using hand power tools and crane. Removal is assumed to require 5 days and fill 4 trailer loads. The mine office is a portable structure and will be removed from the site.
- The power plant consists of gas generators, diesel back-ups, and boilers. Removal using a crane, loader, and laborers will take 1 day and 2 trailers.
- One process train. Each includes piping, hoses, etc. and is skid-mounted. Each is approximately 480 ft long by 75 ft wide by 20 ft high. The train would be drained of all process materials, disconnected to individual skids and hauled away. Once cut up, the volume would be roughly 2,000 CY and weigh 1,995 tons.
- The solvent recovery unit weighs approximately 20 tons and will require a crane to load on a trailer. It will fill 90% of one trailer load to remove.
- The sand dewater unit weighs approximately 20 tons and will require a crane to load on a trailer. It will fill 90% of one trailer load to remove. Assume a 2 day retention time in the process unit. Total sand processed is 13,424,878 CY. With a bulk factor of 1.3, this produces 17,452,341 CY.  $(17,452,341 \text{ CY} / (5 \text{ yr} / (360 \text{ day/yr})) = 9,973 \text{ CY/day}$  or 19,946 CY to be removed to the mine waste area. Liquids in the process train will be minimal and the costs of hauling that material off site are within the costs associated with draining tanks.
- Liners will be removed with the crane and 4 laborers, and placed on a partially loaded trailer load. Because they will be part of another load, no transport fees are included.
- Assumes a daily rental of a 75 cy hydraulic excavator. The excavation work should not take this long, but a daily rate was used for rental transportation and logistics. USOS has an excavator onsite but it is very large and may cause problems/damage due to the size.
- Concrete foundations will be ripped/fractured with a dozer and buried in place.
- Approximately 4,000 feet of fence will be in place around the plant site, including as two metal safety gates, and safety signs. These will be removed once reclamation is completed and vegetation is growing.
- Trash removal will occur after all buildings and facilities are removed, it will involve collection of all refuse, litter, stray metal, pipe, wood, insulation, and other debris. The 316.2-acre area will be inspected by 3 laborers with a pickup truck. All trash will be collected, loaded onto haul trucks, and transported to the Utah County Landfill for proper disposal. Trash volumes and weight are expected to make up only a small part of another existing load, thus no cost for transport or disposal is included here.
- Any fuels remaining on site would be used to fuel equipment used in reclamation work. Most fuel, oil, lubricants will be removed by Tr-State Recycling to their recycling facility located 88 miles from site at no cost, based on quote from Tr-State, March 2008. One trip will be required. No hazardous materials are stored onsite.

[illegible]

1 The gravel parking area is approximately 2.6 acres in size, covered with 4 inches of gravel, making 1,396 CY to be disposed. Gravel will be pushed to the cleaned-out water storage pond location to  
partially fill this void.

2 Reserve ore, processed solids, reject ore stockpiles, and sand from the process unit (see note 6 in demolition tab), all totalling approximately 93,842 CY, will be push-loaded from the plant area to the pit  
area (prior to final grading and reclamation) where an opening will be made to place the ore. The excavated overburden will be used to cover these materials.

3 Areas ripped to relieve compaction using a Cat 14 grader.

4 The mine pit will be backfilled to 50-60% of the original volume as part of the mining process using processed solids and cast-back overburden and interburden. The final cut during mining will create a 3:1  
slope to blend with surroundings (see cross-sections), thus no backfilling will be required in any area during reclamation. The rough backfilled surfaces and other areas (295.7 acres total) will all be finish-  
graded (minor cut and fill) with a Cat 14 grader to assure the land blends with surroundings.

5 A highwall safety berm, extending up to 2,000 linear feet, 4 feet high and 12 feet wide, may be in place on the side of the backfilled pit when reclamation commences. It will be blended into the regraded  
pit with a D8 dozer.

6 Grading of overburden/interburden storage areas will entail reworking approximately 132,259 cubic yards of material to bring these areas to a 3:1 slope. These areas will not need to be ripped as they will  
not be compacted.

7 An assumed 182,491 cubic yards of topsoil and vegetative debris will be redistributed to about a 4-inch depth with a scraper and dozer assist, over 299.7 acres of the mine. Average haul is 600 ft. The 1  
acre of topsoil storage areas will not be topsoiled because they will not be stripped of topsoil.

**NOTES:** No mulch or fertilizer will be used. All affected acres at the mine area will be seeded with a D6 tractor-pulled broadcast seeder. Seed price quote is from Granite Seed, Lehi, Utah, January 2015.

Project: PR Spring Mine  
Date: 04/16/14  
Prepared by: ADS

WORKSHEET 5  
PRODUCTIVITY AND HOURS REQUIRED FOR DOZER USE

Earthmoving Activity:

Regrading highwall, dump tops, dump slopes, and spreading gravel in process area

Characterization of Dozer Used (type, size, etc.):

Caterpillar D10T with an 17'3" wide "Universal or U" -blade

Description of Dozer Use (origin, destination, grade, haul distance, material, etc.):

Operates along contour of dump slopes and on flat surfaces of dump tops and process area; 500-ft average push

Productivity Calculations:

$$\begin{array}{ccccccc} \text{Operator Adjustment Factor} & \boxed{0.75} & \times & \boxed{1.00} & \times & \boxed{0.83} & \times & \boxed{1.00} & \times & \boxed{1.00} \\ & \text{operator} & & \text{material} & & \text{efficiency} & & \text{grade} & & \text{weight} \\ & & \times & \boxed{1.00} & \times & \boxed{1.00} & \times & \boxed{1.00} & = & \boxed{0.62} \\ & & & \text{production} & & \text{visibility} & & \text{elevation} & & \end{array}$$

$$\text{Net Hourly Production} = \boxed{160} \text{ LCY/hr normal hourly} \times \boxed{0.62} \text{ operating} = \boxed{100} \text{ LCY/hr}$$

Hours Required = See 'Earthwork' sheet for total hours required

Data Source(s):

Reference Cat Performance Handbook 43rd edition

Project: PR Spring Mine  
Date: 04/16/14  
Prepared by: ADS

WORKSHEET 11A  
PRODUCTIVITY OF PUSH-PULL OR SELF-LOADING SCRAPER USE

Earthmoving Activity:

Load and haul topsoil to spread in reveg areas. Also load/haul process material to backfill pit.

Characterization of Scraper Used (type, capacity, etc.):

Caterpillar 631G Push-Load Scraper 21 C.Y. (struck) + 31 C.Y. (heaped)

Description of Scraper Use (origin, destination, grade, haul distance, capacity, etc.):

Topsoil stockpiles located throughout the permit boundary to be spread over adjacent areas. Process material (ore, waste, tails) to be moved to backfill pit.

Productivity Calculations:

$$\begin{aligned}\text{Cycle Time} &= \boxed{1.0} \text{ min} + \boxed{1.0} \text{ min} + \boxed{0.5} \text{ min} + \boxed{1.0} \text{ min} \\ &\quad \text{load time} \quad \text{loaded} \quad \text{maneuver and} \quad \text{return trip} \\ &= \boxed{3.5} \text{ min} \\ &\quad \text{(push-pull is)}\end{aligned}$$

$$\begin{aligned}\text{Hourly Production} &= \boxed{25.0} \text{ LCY} \times \boxed{60} \text{ min/hr} \div \boxed{3.5} \text{ min} \times \boxed{0.90} \\ &\quad \text{capacity*} \quad \text{cycle} \quad \text{efficiency} \\ &= \boxed{385.7} \text{ LCY/hr} \\ &\quad \text{(push-pull is)}\end{aligned}$$

Hours Required = See 'Earthwork' sheet for total hours required

\* The average of the struck and heaped capacities; use total for two scrapers for push-pull.

Data Source(s):

Reference Cat Performance Handbook 43rd edition

Project: PR Spring Mine  
Date: 04/16/14  
Prepared by: ADS

WORKSHEET 12  
PRODUCTIVITY AND HOURS REQUIRED FOR MOTORGRADER USE

Earthmoving Activity:

The motor grader will be used for ripping hard surfaces such as topsoil stockpile areas, and roads. Also be used to regrade/contour rough areas and roads.

Characterization of Grader Used (type, size capacity, etc.):

Caterpillar 14H Motor Grader, 215 hp, standard operating weight at 40,000 lbs. equipped with ripper.

Description of Grader Route (push distance, grade, effective blade width, operating speed, etc.):

The grader will rip hard surfaces then regrade/contour to match surrounding environment.

Productivity Calculations:

Grading

$$\begin{aligned} \text{Hourly Production} &= \frac{8}{\text{average}} \text{ mi/hr} \times \frac{8.4}{\text{effective blade}} \text{ ft} \times \frac{5280}{\text{ft/mi}} \times \frac{1}{\text{ac}} \\ &\div \frac{43560}{\text{ft}^2} \times \frac{0.90}{\text{efficiency}} = \frac{7.3}{\text{ac/hr}} \end{aligned}$$

Hours Required = See 'Earthwork' sheet for total hours required

Data Source(s):

Reference Cat Performance Handbook 43rd edition



Project: PR Spring Mine  
 Date: 01/26/15  
 Prepared by: JRS

**WORKSHEET 10**  
**PRODUCTIVITY FOR HYDRAULIC EXCAVATOR USE (BACKHOE OR POWER SHOVEL)**

Earthmoving Activities:

Excavation of production well pipe to disconnect tank.

Characterization of the Excavator Used (type, size, etc.):

Catapillar 311D LRR or similar will be used to excavate well head connection and disconnect well piping from tank

Description of Excavator Used (loading geometry, materials, etc.):

10'X10'X5' excavation of earthen material to expose 6"the water supply line prior to disconnection from the tank.

Productivity Calculations:

$$\text{Net Bucket Capacity} = \boxed{0.75} \text{ LCY} \times \boxed{0.85} = \boxed{0.6} \text{ LCY}$$

heaped bucket capacity      bucket fill factor\*

$$\text{Hourly Production} = \boxed{0.6} \text{ LCY} \times \boxed{60} \text{ min/hr} \div \boxed{0.28} \text{ min} \times \boxed{0.9} = \boxed{122.9} \text{ LCY/hr}$$

net bucket capacity      cycle time\*\*      efficiency factor

$$\text{Hours Required} = \boxed{6.0} \text{ LCY} \div \boxed{122.9} \text{ LCY/hr} = \boxed{0.05} \text{ hr}$$

volume to be handled      net hourly production

\* See loader section of the equipment manual.

\*\* See excavator section of equipment manual.

Data Source(s):